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Maruyama, Munetoshi
The Kyushu University Museum

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New Record of the Seashore Genus *Heterota* (Coleoptera, Staphylinidae, Aleocharinae) from Japan, with Description of a New Species

Munetoshi MARUYAMA

The Kyushu University Museum, Fukuoka, 812-8581 Japan

Abstract. The seashore rove beetle genus *Heterota* is recorded from Japan for the first time. Three species are recognised and described/redescribed, including one new species: *H. onorum* sp. nov.; *H. arenaria* Cameron, 1920; and *H. sunjaei* Park et Ahn, 2008. *Heterota rougemonti* Pace, 1993 is synonymous with *H. arenaria*. A key to the Japanese species of *Heterota* is given. The specimens were collected under seaweed washed on shore and found in soil accumulated in crevices of rocks in supratidal zones.

Key words: taxonomy, Coleoptera, Staphylinidae, bionomics, *Heterota onorum* sp. nov., *H. arenaria*, *H. sunjaei*, new synonym, species key, supratidal zone.

Introduction

Ten species are known in the seashore genus *Heterota* Mulsant et Rey, 1874 (tribe Homalotini) from all zoogeographical regions. Park *et al.* (2008) described a new species *Heterota sunjaei* Park et Ahn from Korea as the first record of the genus from the East Palaearctic Region. Recently, Mr. Hiroki Ono collected specimens of *Heterota* from localities in Honshû and Nansei-shotô, Japan. Subsequently, Mrs. Yasuko Kawakami and Mr. Takeshi Hayama collected specimens of *Heterota* from other localities in Japan. Those specimens included three species, of which two were identified as *H. arenaria* Cameron, 1920 and *H. sunjaei*, and one was found to be an undescribed species. This paper describes the new species, redescribes the distinguishing characters of *H. arenaria* and *H. sunjaei* and provides bionomical information on the Japanese species.

Materials and Methods

Beetles were collected by sifting seaweed washed on shore or from crevices of rocks in supratidal zones (see Bionomics and Distribution). They were put in a killing tube (50 ml) with tissue paper and several drops of ethyl

acetate; 3-5 hours later, they were removed from the tube and dried for pinning. The methods of dissection and making permanent slides and line drawings follow Maruyama (2004, 2006). Photographs were taken using a Canon EOS Kiss X1 with a Canon MP-E 65 mm 1-5× macro lens and mounted using the automontage software CombineZM. The type series of the new species is deposited in the author's collection in the Kyushu University Museum and some identified specimens are in private collections of the collectors.

Heterota Mulsant et Rey, 1874

[Japanese name: Ushio-hanekakushi-zoku]

Heterota Mulsant et Rey, 1874: 194 (original description; type species: *Homalota plumbea* Waterhouse, 1858); Park *et al.*, 2008: 114-117 (annotated catalogue of world species).

Diagnosis. This genus is similar to members of Athetini living in seashore habitat of Japan in body shape and size, but is easily distinguished from them by the broad occiput, prominent eyes, elongate ligula, combined segments I and II of the labial palpi and transverse pronotum (ratio > 1.15).

***Heterota onorum* Maruyama sp. nov.**

[Japanese name: Ushio-hanekakushi]

(Figs. 1, 4-10, 25, 27)

Type series. Holotype, ♂, [JAPAN]: Manazuru-misaki, Manazuru-machi, Kanagawa-ken, 9 X 2008, Ono-H. Paratypes: same data as holotype (1 ♂, 2♀♀, 1 sex?); Nemoto, Shirahama-machi, Minamibôshô-shi, Chiba-ken, 7 XII 2007, Ono-H. (1 sex?).

Distribution. Japan (Honshû).

Etymology. Dedicated to Mr. Hiroki Ono and his wife Mrs. Aiko Ono for their extensive research on seashore insects in Japan, which has resulted in the discovery of many undescribed species, including this new one.

Description.

Body (Fig. 1) robust, hairy; reddish brown, but head and apical half of abdomen darker.

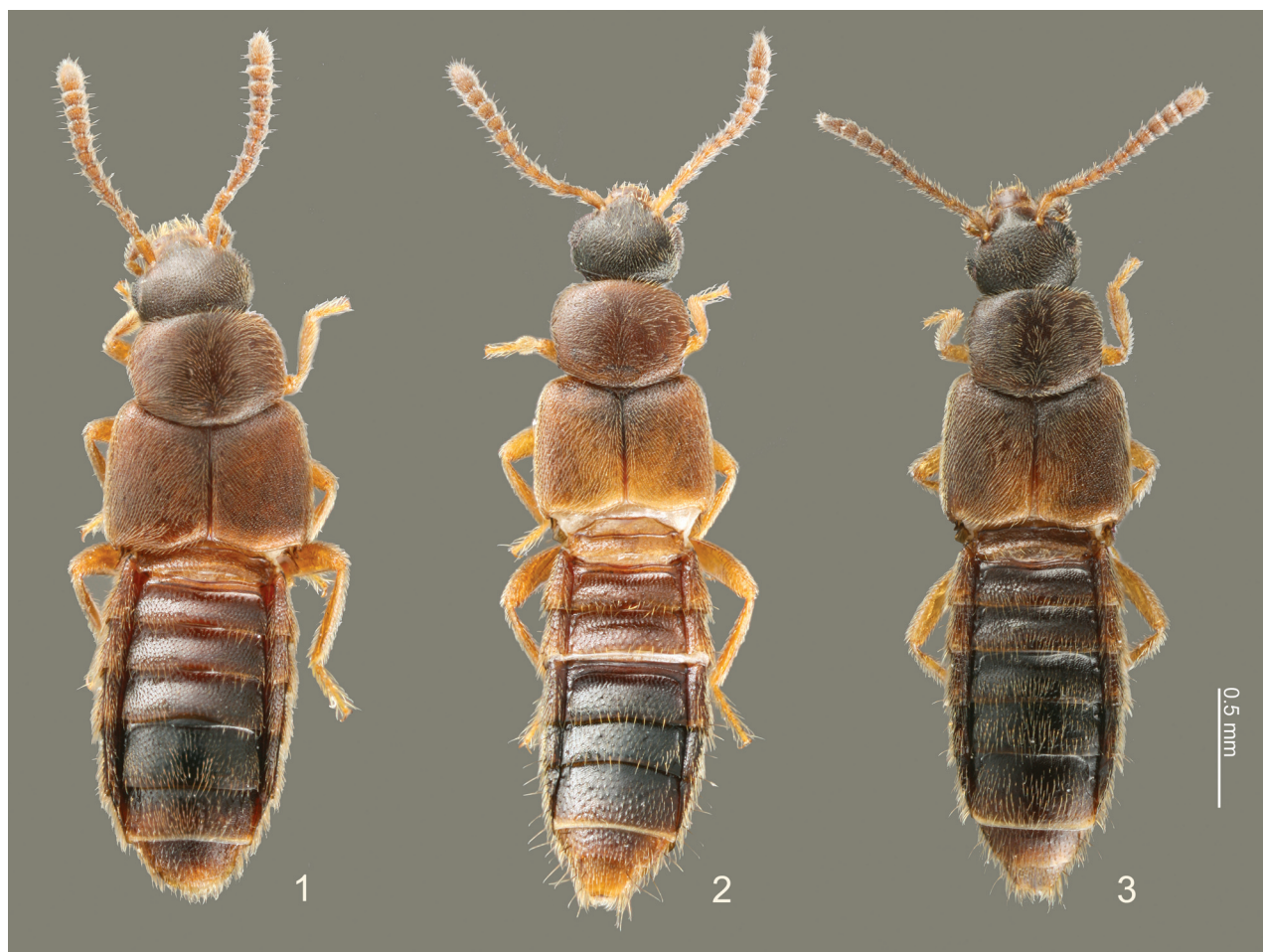
Head (Fig. 1) broad, slightly convex above; surface densely with setae that are becoming longer between

antennal cavities; eyes large, 0.33 as long as head width. Antennae (Fig. 1) short; segment II slightly longer than III; segments IV-VI as long as wide; segments VII-X slightly wider than long; segment XI oval.

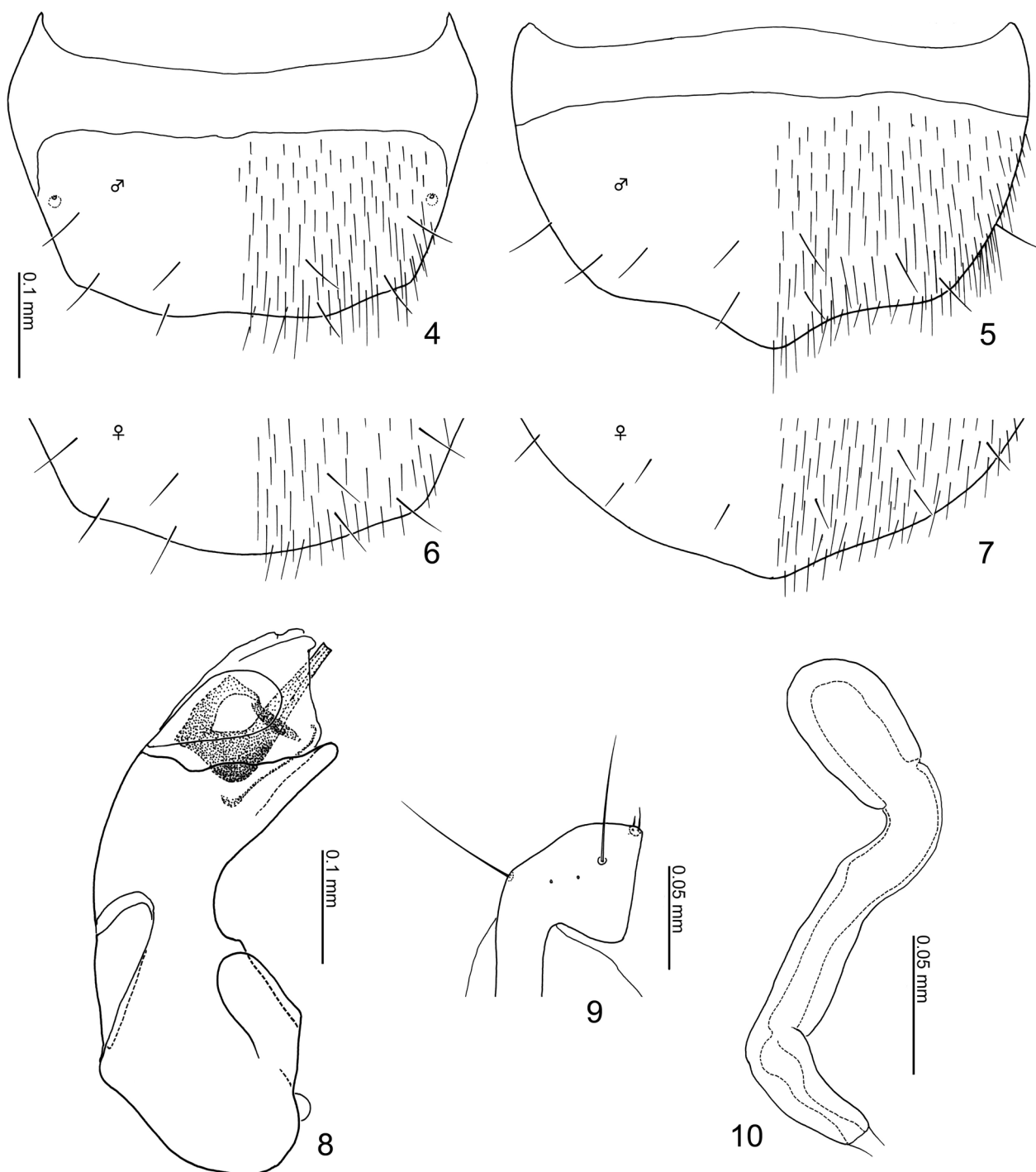
Pronotum (Fig. 1) transverse (ratio, 1.31-1.34), widest around apical 1/3, slightly constricted near base; surface densely with rather long setae that are sub-erecting in mesal area. Elytra (Fig. 1) subparallel-sided; 1.3 times as wide as pronotum; surface densely with long, subrecumbent setae. Legs (Fig. 1) short, rather stout, densely with long setae.

Abdomen broad, slightly wider than elytra; tergites III-V with basal depression rather deep, densely with short setae; tergite VIII (Figs. 4, 6) with 4 macrosetae.

Male: Tergite VIII (Fig. 4) with surface smooth; apical margin not dentate, slightly emarginated medially. Sternite VIII (Fig. 5) with 5 rather short, thin macrosetae; apical margin produced medially. Median lobe of aedeagus (Fig. 8) with apical lobe short in which parameral



Figs. 1-3. Habitus of *Heterota* spp. 1, *H. onorum* Maruyama sp. nov. (paratype); 2, *H. arenaria* Cameron, 1920; 3, *H. sunjaei* Park & Ahn, 2008.



Figs. 4-10. Sexual characters of *Heterota onorum* Maruyama sp. nov. 4, Male tergite VIII (holotype: HT); 5, male sternite VIII (HT); 6, female tergite VIII; 7, female sternite VIII; 8, median lobe of aedeagus, lateral view (HT); 9, apical lobe of paramere, ad-parameral view (HT); 10, spermatheca.

margin almost straight in lateral view; copulatory piece with flagellum thick, short. Apical lobe of paramere (Fig. 9) narrowed apically in ad-parameral view.

Female: Tergite VIII (Fig. 6) with surface smooth; apical margin truncate or rounded medially. Sternite VIII (Fig. 7) with 4 macrosetae; apical margin slightly produced medially. Apical margin of tergite X produced medially. Spermatheca (Fig. 10) with basal part curved basal 1/3; apical part oblong oval.

Measurements. Body length, $\approx$ 2.6-2.9; fore body length, $\approx$ 1.25-1.31; pronotal length, 0.44-0.46; pronotal width, 0.58-0.61; elytral width, 0.76-0.79; hind tibial length, 0.43-0.45.

Diagnosis. This species is somewhat similar to *H. plumbea* (Waterhouse, 1858) known from the Atlantic seashore in the denser setae on abdomen and apical margin of male tergite VIII not being dentate, but is easily distinguished from the former by the stout body and shorter flagellum of the copulatory piece. This species is readily distinguished from the other Japanese species by the robust body, the denser setae on the tergite, the male tergite VIII not being dentate and the other sexual character states illustrated here (Figs. 4-10).

***Heterota arenaria* Cameron, 1920**

[Japanese name: Sango-ushio-hanekakushi]
(Figs. 2, 11-17, 26, 27)

Heterota arenaria Cameron, 1920: 251 (original description; type locality: Singapore); Park *et al.*, 2008: 114 (catalogue).

Heterota rougemonti Pace, 1993: 137 (original description; type locality: Sanur, Bali, Indonesia); Park *et al.*, 2008: 117 (catalogue). **syn. nov.**

Specimens examined. [Japan]: Nagura, Ishigaki-jima, Yaeyama-shotô, Nansei-shotô, 3-5 II 2009, Ono-H. (25).

Distribution. Indonesia (Bali), Japan (Yaeyama-shotô), Singapore.

Additional description.

Body (Fig. 2) brown, but antennae, pronotum, elytra, legs and base of abdomen reddish brown; sometimes pronotum darker.

Male: Tergite VIII (Fig. 11) with surface of mesal to apical area granulate-punctured; apical margin dentate. Sternite VIII (Fig. 12) with 5 macrosetae; apical margin slightly produced medially. Median lobe of aedeagus (Fig. 15) with parameral margin of apical lobe sinuate in lateral view; copulatory piece with flagellum long. Apical lobe of paramere (Fig. 16) narrowed apically in ad-parameral view.

Female: Tergite VIII (Fig. 13) with surface of mesal to apical area slightly granulate-punctured; apical margin truncate or slightly emarginated medially. Sternite VIII (Fig. 14) with 3 macrosetae; apical margin produced medially. Apical margin of tergite X produced medially. Spermatheca (Fig. 17) with basal part widened around middle; apical part subspherical.

Diagnosis. This species is closely related to *H. sunjaei* in general appearance, but distinguished from it by the paler body colour. However, the colouration is variable in this species. Observations of the sexual characters (abdominal segments VIII-X, aedeagus and spermatheca) are needed for precise identification.

Remarks. The illustrations of the habitus and spermatheca in the original description of *Heterota rougemonti* Pace, 1993 agreed well with that of *H. arenaria* (Fig. 17). Pace (1993) distinguished *H. rougemonti* from *H. arenaria* by the colouration and pronotal shape, but these characters are highly variable in *H. arenaria*, and the states of these characters of *H. rougemonti* in the original description can be regarded as a variation of *H. arenaria*. Therefore, *H. rougemonti* is synonymised with *H. arenaria* here.

Park *et al.* (2008) illustrated the sexual characters of this species, but they are inaccurate; specifically, the structure of the aedeagal median lobe is misinterpreted. Therefore, those characters of this species are reillustrated here.

***Heterota sunjaei* Park et Ahn, 2008**

[Japanese name: Kiashi-ushio-hanekakushi]
(Figs. 3, 18-24, 25, 27)

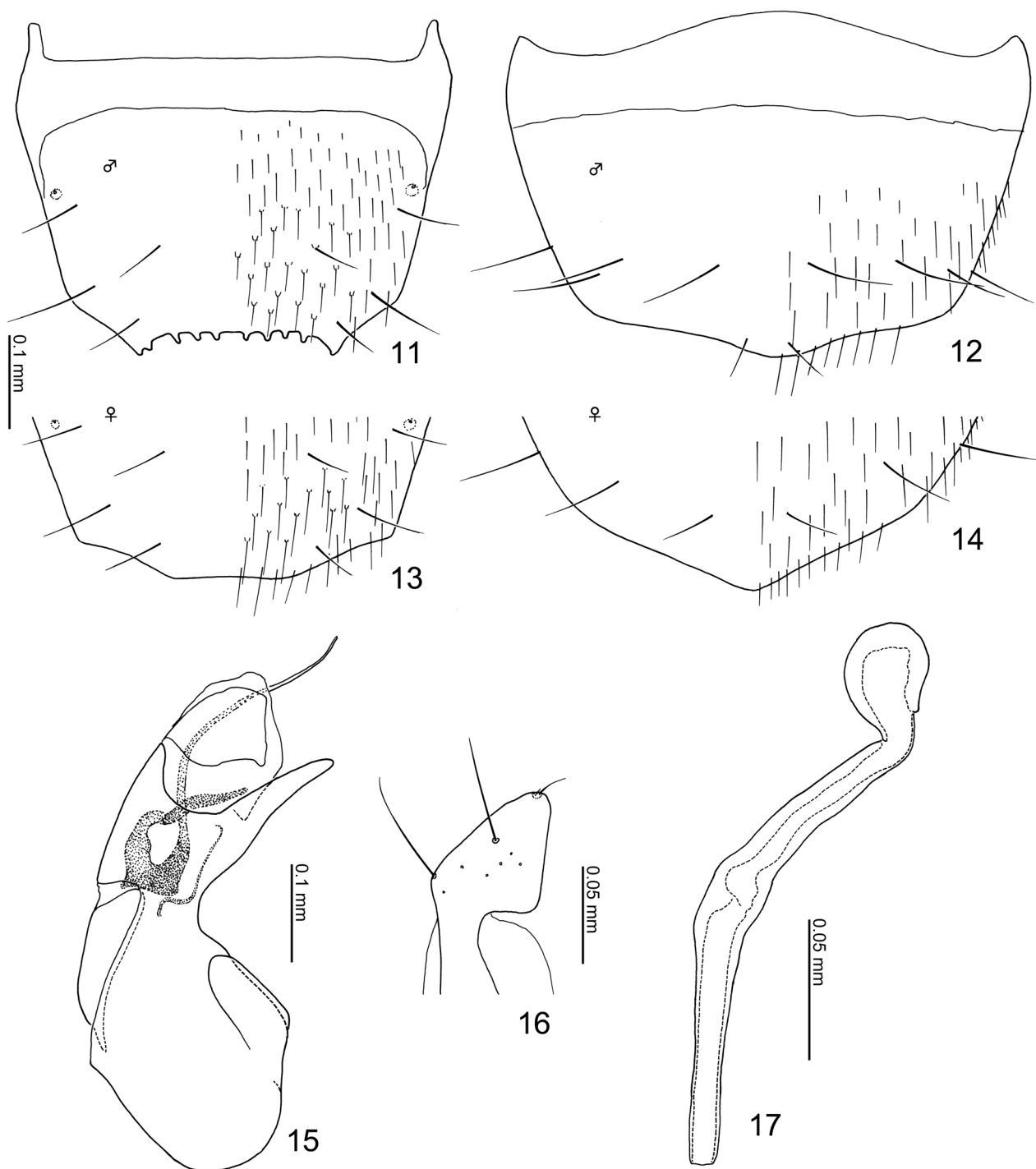
Heterota sunjaei Park et Ahn in Park *et al.*, 2008: 111 (original description; type locality: Geumgab Beach, Jindo, Jeonnam-do, Korea).

Specimens examined. [JAPAN]: Nojima-zaki, Shirahama-machi, Minamibôsô-shi, Chiba-ken, 29 VI 2007, Ono-H. (4); Nemoto, Shirahama-machi, Minamibôsô-shi, Chiba-ken, 29 VI 2007, Ono-H. (3); same data but 7 XII 2007 (8); same data but 20 I 2010 (12); same data but 18 IV 2010 (12); Manazuru-misaki, Manazuru-machi, Kanagawa-ken, 17 X 2010, Ono-H. (6); Sonoura, Kada, Wakayama-shi, 13 X 2009, Kawakami-Y. (1); Akaishihana, Hino-misaki, Taisha-machi, Shimane-ken, 6-12 VI 2009, Hayama-T., by FIT (1).

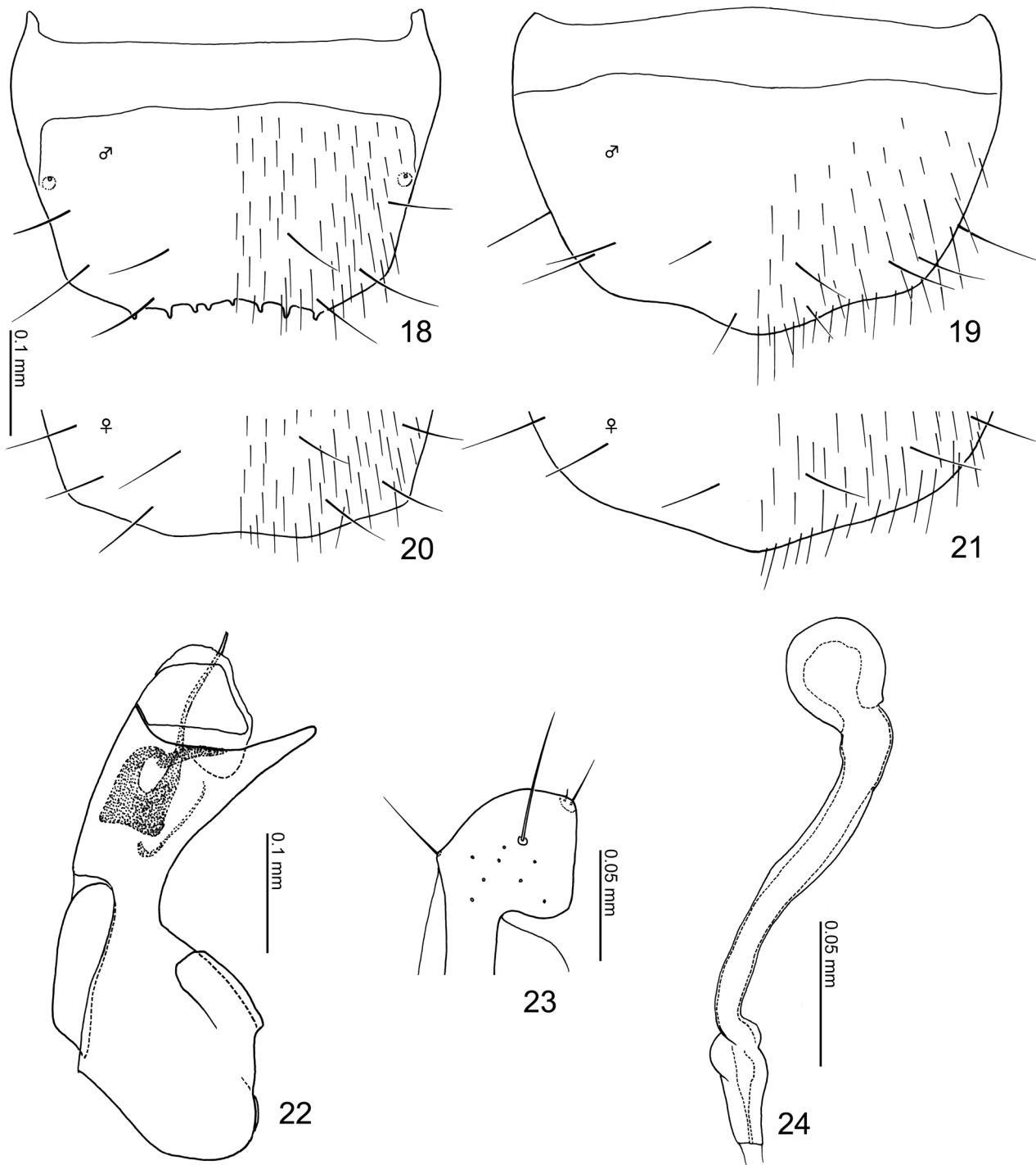
Distribution. Japan (Honshû), Korea.

Additional description.

Body (Fig. 3) dark brown, but antennae and legs yellowish brown; sometimes pronotum, elytra and base of



Figs. 11-17. Sexual characters of *Heterota arenaria* Cameron, 1920. 11, Male tergite VIII; 12, male sternite VIII; 13, female tergite VIII; 14, female sternite VIII; 15, median lobe of aedeagus, lateral view; 16, apical lobe of paramere, ad-parameral view; 17, spermatheca.



Figs. 18-24. Sexual characters of *Heterota sunjaei* Park et Ahn, 2008. 18, Male tergite VIII; 19, male sternite VIII; 20, female tergite VIII; 21, female sternite VIII; 22, median lobe of aedeagus, lateral view; 23, apical lobe of paramere, ad-parameral view; 24, spermatheca.

abdomen paler.

Male: Tergite VIII (Fig. 18) with surface of mesal to apical area slightly granulate-punctured; apical margin dentate. Sternite VIII (Fig. 19) with 5 macrosetae; apical margin slightly produced medially. Median lobe of aedeagus (Fig. 22) with parameral margin of apical lobe straight in lateral view; copulatory piece with flagellum long. Apical lobe of paramere (Fig. 23) slightly narrowed apically in ad-parameral view.

Female: Tergite VIII (Fig. 20) with surface smooth; apical margin truncate or slightly emarginated medially. Sternite VIII (Fig. 14) with 3 macrosetae; apical margin produced medially. Apical margin of tergite X produced medially. Spermatheca (Fig. 17) with basal part widened around base; apical part subspherical.

Diagnosis. This species is closely related to *H. arenaria* in general appearance, but distinguished from it by the darker body colour. However, the colouration is variable in this species. Observation the sexual characters is needed for precise identification.

Remarks. The illustrations of the sexual characters in the original description are inaccurate; specifically, the structure of the aedeagal median lobe is misinterpreted and not informative for identification. Therefore, redrawn illustrations and an additional description of those characters are provided here.

Key to the Japanese Species of *Heterota*

1. Body robust (Fig. 1). Pronotum (Fig. 1) with ratio > 1.3. Apical margin of male tergite VII (Fig. 4) not dentate. Copulatory piece of aedeagal median lobe (Fig. 8)

with a thick, short flagellum. Apical part of spermatheca (Fig. 10) oblong oval *H. onorum* sp. nov.

- Body slender (Figs. 2, 3). Pronotum (Figs. 2, 3) with ratio < 1.2. Apical margin of male tergite VII (Figs. 11, 18) dentate. Copulatory piece of aedeagal median lobe (Figs. 15, 22) with a thin, long flagellum. Apical part of spermatheca (Figs. 17, 24) subspherical 2
- 2. Flagellum of copulatory piece of aedeagal median lobe (Fig. 15) long. Basal part of spermatheca (Fig. 17) thickened around middle *H. arenaria*
- Flagellum of copulatory piece of aedeagal median lobe (Fig. 22) rather short. Basal part of spermatheca (Fig. 24) thickened around base *H. sunjaei*

Bionomics and Distributions

According to Mr. H. Ono, *Heterota onorum* and *H. sunjaei* were collected by sifting seaweed washed on rocky or gravel beaches in Nemoto, Chiba-ken (Fig. 25) and Manazuru, Kanagawa-ken in autumn (October), together with *Cafius*, *Aleochara* and *Atheta* rove beetles. The habitat of these species in their active season is probably under seaweed washed ashore. Nevertheless, most *Heterota sunjaei* were collected in soil accumulated between crevices of a rocky shore in supratidal zones of Nemoto. This is considered the overwintering habitat of *H. sunjaei* (December), although many beetles were also collected from spring to early summer (April–June), which is apparently the active season of this species. They may also use the crevices in rocks as habitat, in addition to living under seaweed. *Heterota arenaria* was also collected from crevices on a rocky shore in Nagura,



Figs. 25-26. Collecting sites of *Heterota* species in Japan. 25, Nemoto, Shirahama-machi, Minamibôsô-shi, Chiba, Honshû (*H. onorum* and *H. sunjaei*); 26, Nagura, Ishigaki-jima, Okinawa, Nansei-shotô (*H. arenaria*). Photo © H. Ono.

Ishigaki-jima (Fig. 26), but they were apparently overwintering (February). Mr. T. Hayama collected numerous specimens of *H. sunjaei* with flight interception traps set on sandy beaches in Shimane from spring to summer, demonstrating their flight ability.

Although the Japanese species of *Heterota* have been collected in one or a few localities (Fig. 27), considering the wide distribution of the other seashore rove beetles, they should occur in many other localities in Japan; in particular, *H. onorum* and *H. sunjaei* will likely be found in most temperate areas on mainland Japan. *Heterota arenaria*, which is known from Singapore, Bali and Nansei-shotô, is probably widespread throughout tropical and subtropical Asia.

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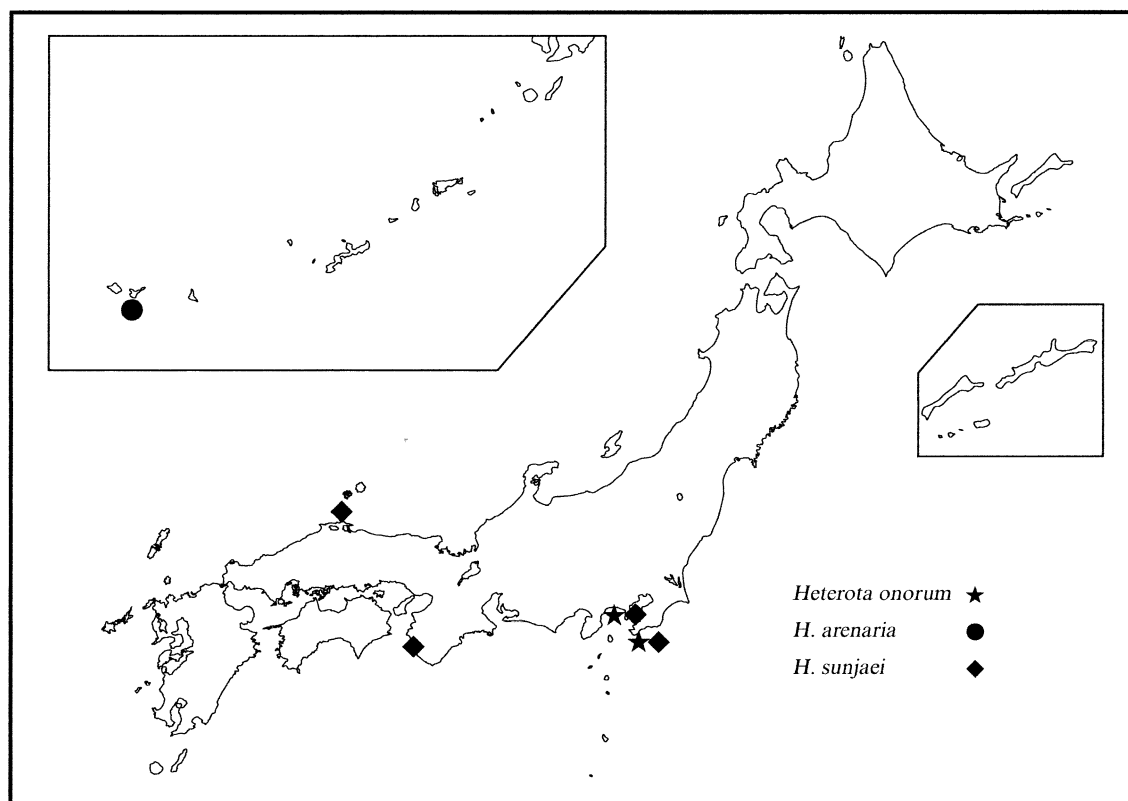


Fig. 27. Known localities of *Heterota* species in Japan. Black star, *H. onorum* Maruyama sp. nov.; black circle, *H. arenaria* Cameron, 1920; black diamond, *H. sunjaei* Park et Ahn, 2008.